

**Vapor Recovery Program  
No. VR306 for a Vacuum Assist System**

**1. Introduction**

This procedure is designed for a Vapor Recovery Vacuum Assist System. The procedure sets forth testing requirements and identifies the responsibilities and authorities for the Registered Service Representative (RSR), and the State Inspector. Within each section of the SOP there are three subsections. The first subsection spells out the responsibility and authorities for the RSR while the second subsection spells out the responsibility and authorities for the State inspector. The third subsection is to be used by the State inspector for documenting the results of test.

**2. Purpose**

The purpose of this SOP is to set forth the responsibilities and authorities for both the vapor recovery RSR and the State inspector with respect to the initial or annual vapor recovery test. It is also the purpose of this procedure to create consistency between State inspectors, RSRs, and from test to test.

**3. Responsibility and Authority**

RSR is responsible for conducting the annual test using the methods required under state statute and regulations. And at the same time conduct those tests in a manner set forth in the regulations for an RSR.

State Inspector will conduct his or her inspection as required under this SOP and represent the Department at a witnessed initial or annual test.

**PROCEDURE:**

**4. PRE-INSPECTION:**

**4.1. Registered Service Representative (RSR), Responsibilities and Authorities:**

If a pre-test is conducted by an RSR prior to the witnessed annual test, the RSR must have completed that test successfully.

- 4.1.1. RSR will be able to repair/replace the P/V caps, dry breaks and conduct A/L tests up to one (1) hour prior to scheduled start time. (NOTE: There is a prohibition of the addition of any fuel into the storage tanks – TO INCLUDE RETURN OF FUEL FROM THE A/L PRE TEST CHECKS --based upon the type of test (8 hours for the short test and 3 hours for the long test procedures.)
- 4.1.2. If a pre-test is conducted the RSR will have completed the Pre-test Checklist. If a pretest is not performed the RSR will indicate that no pretest was conducted on the Pre-test Checklist. The RSR will present both the Pre-test Checklist and the Test Method Selection sheet signed by the RSR and site owner/operator to the State inspector prior to conducting the annual test.
- 4.1.3. The RSR at the scheduled time of the witnessed annual test will present the following documents to the State inspector: 1. Current tank inventory 2. Last fuel delivery (per Veeder Root or Encompass systems) 3. BMF No., for the station being tested 4. Daily inspection logs and maintenance logs.

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Note: If the required documentation is not presented before the time of the test, the owner / operator or RSR shall be subject to a civil penalty under AAC R20-2 905.

- 4.1.4. The RSR or site owner/operator must remove dispenser panels from both sides.
- 4.1.5. For vaulted systems the RSR will have the vaults open for the State inspector to visually inspect interior.
- 4.1.6. The RSR will ensure that all hoses, nozzles, and spill buckets will be drained prior to testing as required.

**4.2. State Inspector Responsibilities and Authorities:**

- 4.2.1. The State inspector will identify him or her self and present their Department photo identification, and state the purpose of your visit as required under Department Policies and Procedures No. 100.
- 4.2.2. The State inspector will review with the manager or responsible party, the regulatory bill of rights and have them sign, acknowledging receipt on the form (DWM 149), the State Inspector will also **review the site license** and record the BMF No.
- 4.2.3. The State inspector will examine the tanks for fuel levels and water content and check drop tube length. Physically "stick" the tanks this shall be done using water finding paste, to obtain volume levels. Record liquid volume amount using stick reading and appropriate tank chart, record on WM Pressure Decay form, do this with no pressure on the tanks. If there is alcohol in the gas per the Product Transfer Documents (PTD) they are not allowed to have any water, if there is water in the tank issue a Stop Sale/Stop Use Order (DWM 53). If there is no alcohol in the gas they are allowed to have up to 1" of water in the tank.
- 4.2.4. Check the drop tube length. There is no minimum height, but the maximum is 6" from the bottom of the tank at its highest point. Answer the question on the inspection form. If the highest point is more than 6" from the bottom of the tank a Stop Sale/Stop Use Order (DWM 53) must be issued.
- 4.2.5. The State inspector will conduct calculations and verify for appropriate test method. Subtract liquid volume from actual tank capacity this gives you amount of ullage in the tank(s) ( $A - C = \text{ullage}$ ). For TP 91-1 Pressure Decay / Leak Test to determine length of test you take total ullage divided by 1000 and multiply by 5 this gives you length of test time in minutes. Always round the amount of ullage to the next 1000 (i.e. 8,145 rounds up to 9,000). For TP 96-1 consult chart in test procedure for test times. All this information is reported on the State form DWM 77A.
- 4.2.6. The State inspector will conduct a visual inspection of the site, (Use Fueling Device Form DWM 40).
- 4.2.7. Inspect hanging hardware for visible damage, leaks, tears, wrong type equipment installed, etc. (See AAC R20-2-907(D))
- 4.2.8. Check for placement and readability of decals.
- 4.2.9. Decals required:
  - 4.2.9.1. Dispenser number for documentation purposes
  - 4.2.9.2. Display labeling
  - 4.2.9.3. Octane labels
  - 4.2.9.4. Fueling Instructions/Department phone number (602-255-5211)

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- 4.2.9.5. Oxygenate labeling
- 4.2.9.6. Product grade label
- 4.2.9.7. All computer displays and values must be legible
- 4.2.10. Visually inspect the inside of all dispensers for:
  - 4.2.10.1. Ensure Ball valves inside of dispensers in the "open" position
  - 4.2.10.2. There are no liquid leaks
  - 4.2.10.3. Lead wire security seals are affixed as required by NIST Handbook 44 G-UR.4.5.
  - 4.2.10.4. Check dispensers for correct and current labeling.
  - 4.2.10.5. Slope of vapor recovery piping must slope down towards riser
  - 4.2.10.6. Equipment that shows signs of tampering
- 5.1.1. Ensure at least one (1) vent pipe has an eighth inch (1/8") threaded plug, installed between six (6) and eight (8) feet above grade, and make sure it is painted correctly.
- 5.1.2. Verify all equipment installed meets the CARB requirements for the approved vapor recovery system. Note any modifications on the WM assignment sheet.
- 5.1.3. Visually inspect the vault e-vents (via mirror etc). Note: do not enter a confined space according to Department Policy and Procedure 109.
- 5.1.4. Check the Veeder Root / alarm system for alarm state.

Note: If there are deficiencies during visual inspection list them on the Fueling Device Form (DWM 40), include the amount of time given to correct.

**4.3. State Inspector Documentation of Results:**

All information will be entered onto Department form DWM 149 or DWM 40.

- 4.3.1. Enter the product ID and the stick readings into the inspection form
- 4.3.2. Measure and record drop tube length on the inspection form
- 4.3.3. Use only for manifolded systems.
- 4.3.4. Yes or No. Is the point of the drop tube more than 6 inches from the tank bottom. If "yes" then issue a Stop Sale/Stop Use Order (DWM 53).
- 4.3.5. Yes or No. If box 16 minus box 17 is greater than 1 wci answer "yes" and the test fails issue a top Sale/Stop Use Order (DWM53).
- 4.3.6. Yes or No. Determine this while system is being put under pressure also after pressure decay test is concluded.
- 4.3.7. Depress each dry break for approximately 2-3 seconds. If it is a manifolded system there should be pressure at all gasoline dry breaks, not at the diesel dry break. If it is a non-manifolded system determine if there is pressure at the dry break after the pressure decay test is concluded on each individual tank. If there is no pressure at the dry break on gasoline tanks or there is pressure at the diesel dry break the system fails, there is a problem with the piping issue a Stop Sale/ Stop Use Order (DWM 53).
- 4.3.8. Yes or No. Determine using the appropriate method. If "yes" then the site fails, diesel tanks must be isolated from vapor recovery system issue a Stop Sale/Stop Use Order (DWM 53).
- 4.3.9. Have owner/operator sign.
- 4.3.10. Print your name and inspector number.

- 4.3.11. Write "pass" or "fail," list deficiencies, re-test fee if needed and timeframe to correct deficiencies.

## **5. PRESSURE DECAY TEST:**

Test MUST begin within thirty minutes (30) of scheduled test time, with consideration by the State inspector for larger ullage amounts, and NO REPAIRS can be made once testing has begun. All gasoline sales will be suspended until all testing is completed.

Pressure decay testing will be conducted with caps off of vapor and liquid fills, no fuel drops within 3 hours of scheduled test time, all tanks should be at least 40% full but not more than 90% full, ball valves inside of dispensers in the "open" position, and Vent Pipe(s) Cap off.

### **5.1. Registered Service Representative (RSR), Responsibilities and Authorities:**

- 5.1.1. The RSR may now start introducing nitrogen into the system for the test at a rate NOT to exceed 5 cubic feet per minute (cfm) or 1 pound per square inch (psi).
- 5.1.2. The RSR will test the vent caps to ensure they meet the requirements for +/-3 water column inch (wci) on pressure side and +/-8 wci for the vacuum side, test criteria includes ability to hold for both pressure and vacuum at the specified rate. If the vent cap is defective the test will proceed and the cap will be replaced and tested to verify that it is functioning. A civil penalty will be issued.
- 5.1.3. When the system is pressured to between 8 and 10 wci, check the dry breaks. The RSR will test each dry break to ensure they all seal correctly, by quickly depressing and releasing the plunger and testing the seal with soapy water. If it fails to hold, it shall be tested to a max of 3 more times, before it is considered defective and while testing will be continued, it must be repaired or replaced and retested by the RSR after completion of witnessed annual testing, within 24 hours and documented on the Maintenance Log. A civil penalty may be issued because the equipment is not operating as designed. The results shall be faxed to the Department upon completion of repairs and retests.
- 5.1.4. The RSR will check the zero shift on the manometer prior to pressurizing to 11 wci.
- 5.1.5. The RSR will then pressurize the tanks to 11 wci, with 15 minutes stabilization time per TP 91-1, and 10 min stabilization time on TP 96-1. At the end of the stabilization time the tank pressure shall be either dropped to 10wci or raised to 10 wci, as appropriate.
- 5.1.6. The RSR will check for zero shift of the manometer and the test shall begin.
- 5.1.7. The RSR upon completion of pressure decay test will recheck the manometer for zero shift (Note if there is a shift in zero the Inspector will use the difference to determine pass or fail).
- 5.1.8. The RSR upon completion of the pressure decay test and prior to continuing the rest of the annual test shall replace the vent caps and start the turbines.

### **5.2. State Inspector Responsibilities and Authorities:**

- 5.2.1. Ensure ZERO tank pressure.

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- 5.2.2. Ensure ZERO on the manometer prior to the start of pressurization, after it has stabilized and at the end of the test. (A digital manometer is preferred)

**5.3. State Inspector Documentation of Results:**

All information will be entered onto Department form DWM 77A.

- 5.3.1. Pressure Decay Form (DWM 77A)
- 5.3.2. BMF No. - get off license or bubble sheet
- 5.3.3. Inspection No. - found on bubble sheet
- 5.3.4. ATC No. - found on bubble sheet
- 5.3.5. Date - date you are inspecting
- 5.3.6. Test contractor - company and individuals name Located at the bottom of the test sheet.
- 5.3.7. Circle appropriate system type
- 5.3.8. Dispenser No. – found on dispenser
- 5.3.9. List actual grades (i.e. 87, 89, 91)
- 5.3.10. Actual capacity in gallons
- 5.3.11. Physical stick reading
- 5.3.12. Record liquid volume amount using stick reading and appropriate tank chart.
- 5.3.13. Actual time pressure decay test begins
- 5.3.14. Actual time pressure decay test ends
- 5.3.15. Total amount of time test ran (end time - start time = total elapsed time)
- 5.3.16. Record actual test gauge value at start of test
- 5.3.17. Record actual test gauge value at end of test. If the pressure drop exceeds 1 wci in TP91-1 or exceed the listed values in TP96-1 the site fails, and you must issue a Stop Sale/ Stop Use Order (DWM53).
- 5.3.18. Record pass or fail for the test. (Failure to pass this test is considered to be a site failure and you must issue a Stop Sale/Stop Use Order DWM 53)
- 5.3.19. Have owner/operator sign form or indicated that they “Refused to sign”.

**6. LIQUID BLOCKAGE TEST:**

**6.1. Registered Service Representative (RSR), Responsibilities and Authorities**

- 6.1.1. RSR will check to ensure all dispensers have a 1 inch tee port on vapor recovery riser, with easy access. If not WM will issues Stop Sale/Stop Use Order (DWM 53) for the dispenser(s) that don't meet the requirements. (Note: rubber hose is not acceptable for making the connection from the dispenser to the riser as per Vapor Recovery Alert No. 3.)
- 6.1.2. On annual tests use 5 gals down the furthest points on each branch/island, unless there is indication of construction or modification of the VR system. Allow 15 minutes for gasoline to clear back to the storage tanks.
- 6.1.3. On a VR Initial test pump 5 gallons down each vapor recovery tee port and re-cap each port. On systems with vapor pots, use 1 gal per branch/island, you will

need to allow more time up to 30 minutes with the appropriate turbine engaged to clear the vapor pot.

- 6.1.4. Failure to pass this portion of the test is considered to be a site failure and DWM 53 is to be issued per, (41-2132D or R20-2-905c, code 714 or 910d on any portion of the tests).

**6.2. State Inspector Responsibilities and Authorities:**

- 6.2.1. On the initial test all the dispensers will be tested and on the witnessed annual test check the furthest dispenser on each branch.
- 6.2.2. Have tester introduce nitrogen into the system to 20 cubic feet per hour (cfh). Record value off gauge. (maximum allowable @ 20 cfh is .15 on 1 wci gauge).
- 6.2.3. Have tester introduce nitrogen into the system to 60 cfh. Record value off gauge. (maximum allowable @ 60 cfh is .45 on 1 wci gauge).
- 6.2.4. Have tester introduce nitrogen into the system to 100 cfh. Record value off gauge. (maximum allowable @ 100 cfh is .95 on 1 wci gauge)

**6.3. State Inspector Documentation of Results:**

All information will be entered onto Department form DWM 77.

- 6.3.1. BMF No. - found on license or assignment sheet
- 6.3.2. Inspection No. - found on assignment sheet
- 6.3.3. ATC No. - found on assignment sheet
- 6.3.4. Date – date you are inspecting
- 6.3.5. Circle appropriate system type
- 6.3.6. Dispenser No. - found on dispenser
- 6.3.7. Product – use octane rating
- 6.3.8. List test company and tester
- 6.3.9. Print your name and inspector number
- 6.3.10. Have owner/operator sign form
- 6.3.11. Test the pressure/vacuum vent valve with Leak Check. Use Leak Check SOP.

Note: Any value above the maximum allowable values constitutes a failure for that grade on that dispenser. Blue tag that nozzle and issue a Stop Sale/Stop Use Order (DWM 53).

If the introduction of nitrogen goes more than double the first value (of 20cfm), the test will be restarted and fuel reintroduced (except for systems with vapor pot)

***ON NEW OR REMODELED STATIONS*** pump 5 gallons down each vapor recovery tee port and re-cap each port. ***ON STATIONS THAT ARE NOT NEW OR REMODELED PUMP 5 GALLONS DOWN EACH VAPOR TEE PORT IN THE FURTHEST DISPENSER ON EACH BRANCH FROM THE TANK PAD***, until all nozzles and grades are tested and recorded.

**7. COMMUNICATION TEST:**

**7.1. Registered Service Representative (RSR), Responsibilities and Authorities:**

- 7.1.1. Close all dry breaks.
- 7.1.2. Introduce nitrogen @ 100 cfh. Observe gauge, once gauge reaches a value more than 20 points higher than the highest reading on blockage, on 1 wci gauge, release the pressure at the dry break. Identify dispenser that you are at, identify and record the tank grade and value, with dry break closed and open. Repeat for each tank from each branch and record values.
- 7.1.3. All communication tests will be performed from the furthest dispenser on each branch from the tank pad.
- 7.1.4. The communication test will be conducted from the same dispenser as the blockage test. For an initial test the communications test will be conducted from the furthest point on each branch.
- 7.1.5. Note: Once you release the pressure at the dry break there should be an immediate and significant drop, at least .1 on a 1wci gauge. If there is a blockage, that particular branch needs to be blue tagged and a Stop Sale/Stop Use Order is issued (DWM 53).

**7.2. State Inspector Responsibilities and Authorities:**

- 7.2.1. State Inspector will observe the test and record results on the state forms.

**7.3. State Inspector Documentation of Results:**

All information will be entered onto Department form DWM 77.

- 7.3.1. List testing company and tester
- 7.3.2. Print your name and inspector No
- 7.3.3. Have owner/operator AND RSR sign form

**8. AIR TO LIQUID RATIO TEST, (ORIFICE METER):**

The VacuSmart or VacuChek Vacuum Assist Vapor Recovery System Analyzer is considered an equivalent determinant test. This test is only considered valid for the vapor recovery systems listed in the manual or with the programmed software. Other vapor recovery systems require the use of a Roots Meter. The use of the VacuSmart or the VacuCheck for determining A/L on Healy 600 or 800 systems is **not permitted**. You can only use the Roots Meter in determining A/L.

**8.1. Registered Service Representative (RSR), Responsibilities and Authorities:**

- 8.1.1. Close all dry breaks.
- 8.1.2. It is required that 2 wci must be introduced into the system before conducting the A/L test.
- 8.1.3. Start the test as soon as State inspector authorizes.
- 8.1.4. Use 7 hole donut only. Check to see that the serial number on the donut matches the serial number on the test unit.

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- 8.1.5. Select system type in VacuSmart programming.
- 8.1.6. To determine allowable air to liquid ratios see CARB Executive Order for the type of VR system being tested.
- 8.1.7. For each nozzle dispense fuel per manufacturer instructions. Begin dispensing fuel start timing at .5 or 1 gallon, time for 2 additional gallons. Check each grade of gasoline.

**8.2. State Inspector Responsibilities and Authorities:**

- 8.2.1. To determine allowable air to liquid ratios see CARB Executive Order for the type of VR system being tested.
- 8.2.2. The State Inspector will monitor and record test results.

**8.3. State Inspector Documentation of Results:**

All information will be entered onto Department form DWM 96.

- 8.3.1. BMF No. - found on license or assignment sheet
- 8.3.2. Inspection No. - found on assignment sheet
- 8.3.3. ATC No. - found on assignment sheet
- 8.3.4. Date - date you are inspecting
- 8.3.5. Enter serial number of VacuSmart (VS)
- 8.3.6. Enter last calibration date (if more than 1 year has passed the VacuSmart cannot be used)
- 8.3.7. Enter dispenser number
- 8.3.8. Enter product octane rating
- 8.3.9. Record air to liquid value from VacuSmart display
- 8.3.10. Record gpm value from VacuSmart display

Note: If a nozzle is not within the allowable air to liquid ratio, with average of 3 test drafts, blue tag the nozzle and issue a stop sale/stop use order (DWM 53).

**9. AIR TO LIQUID RATIO TEST, (ROOTS METER):**

**9.1. Registered Service Representative (RSR), Responsibilities and Authorities:**

**Note:** The use of the VacuSmart or the VacuCheck for determining A/L on Healy 600 or 800 systems is not permitted. You can only use the Roots Meter in determining A/L.

- 9.1.1. Use OPW nozzle adapter for all nozzles, except Husky. (Use Husky nozzle adapter for Husky nozzles), and for 800 (use Healy adaptor).
- 9.1.2. Each time you move the roots meter, dispense 1 gallon of gasoline to reset gears. Then record new starting point/value for A/L test.
- 9.1.3. Ensure nozzle is inserted completely into nozzle adapter and that both caps on adapter are tight.
- 9.1.4. Make sure that the outlet port of the roots meter is unobstructed.



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**9.2. State Inspector Responsibilities and Authorities:**

- 9.2.1. To determine allowable air to liquid ratios see CARB Executive Order for the type of VR system being tested.
- 9.2.2. Monitor and record test results.

**9.3. State Inspector Documentation of Results:**

All information will be entered onto Department form DWM 124.

- 9.3.1. BMF No. - found on the license or assignment sheet
- 9.3.2. Inspection No. - found on the assignment sheet
- 9.3.3. ATC No. - found on the assignment sheet
- 9.3.4. Date - date you are inspecting
- 9.3.5. Testing company
- 9.3.6. Testing conductor
- 9.3.7. Enter dispenser number
- 9.3.8. Enter product octane rating
- 9.3.9. Record stop watch reading for 2 gallons
- 9.3.10. Determine gallons per minute (120/stop watch reading for 2 gallons)
- 9.3.11. Record starting value on roots meter
- 9.3.12. Record ending value on roots meter
- 9.3.13. Record difference
- 9.3.14. Record dispenser starting gallons value
- 9.3.15. Record dispenser ending gallons value
- 9.3.16. Determine number of gallons dispensed
- 9.3.17. Enter any re-test figures or remarks
- 9.3.18. Print your name and inspector No
- 9.3.19. Signature of owner operator

Note: If a nozzle is not within the allowable air to liquid ratio, with average of 3 drafts, blue tag nozzle and issue a Stop Sale/Stop Use Order (DWM 53).

*This policy supercedes all other editions.*

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